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of projection, 30-52. *Part II*: Introduction, 53-57; The polyconic projection, 58-66; The Bonne projection, 67-70; The Lambert zenithal (or azimuthal) equal-area projection, 71-76; The Lambert conformal conic projection with two standard parallels, 77-86; The Grid system of military mapping, 87-90; The Albers conical equal-area projection with two standard parallels, 91-100; The Mercator projection, 101-136; Fixing position by wireless directional bearings, 137-139; The gnomonic projection, 140-145. *World maps*: The Mercator projection; The stereographic projection; The Aitoff equal-area projection of the sphere; The Mollweide homolographic projection; Goode's homolographic projection (interrupted) for the continents and oceans; Lambert projection of the northern and southern hemispheres; Conformal projection of the sphere within a two-cusped epicycloid; Guyou's doubly periodic projection of the sphere, 146-160. Index, 161-163.

Examples in Differential and Integral Calculus with Answers. By the late C. S. JACKSON. (Longmans' Modern Mathematical Series.) London and New York, Longmans, Green and Co., 1921. 8vo. 8 + 142 pages. Price \$3.25.

First paragraphs of preface by W. M. Roberts: "This collection of Examples in the Calculus, which was made by the late Mr. C. S. Jackson, should have been published in 1917. Mr. Jackson's sudden and regrettable death in October, 1916 [see this MONTHLY 1917, 144] caused the publication to be delayed till after the War. The book is hampered by having to be put through the press by other hands than the author's.

"A great many of those examples which can be classed as problems were constructed by Mr. Jackson himself in connection with his work at the Royal Military Academy, Woolwich, and the many public examinations in which he took part. Many of them are very neat applications of the Calculus to practical problems, and it is hoped that these will prove particularly useful to teachers who require, in their work, a number of examples which are not mere Algebraical manipulations. Many books on the Calculus treat the subject chiefly as an extension of Algebra and Analytical Geometry. This collection should be a useful supplement to such books."

Contents—*Part I, Differential Calculus*, 1-53: Differentiation; tangents and slopes; dy/dx as a rate of increase; easy maxima and minima; velocity; differentiation of logarithms; errors and rates; approximation to roots of equations; Newton's method of approximating to the roots of an equation; maxima, minima; harder questions on tangents and normals; errors; velocity; miscellaneous examples; successive differentiation; the theorem of Leibnitz; miscellaneous expansions; indeterminate forms; Taylor's theorem and applications; curvature; examples on maps; partial differentiation. *Part II, Integral Calculus*, 54-120: Known results of differentiation; methods of integration; hyperbolic functions; integration; areas; planimeters and integragraphs; areas and volumes; volumes; problems on simple integration; mean values; rectification and areas of surfaces; centers of gravity; second moments, or moments of inertia; center of pressure; pendulum; differential equations; double and triple integration. *Answers*, 121-142.

This work is one of the Series containing G. B. Mathews's *Projective Geometry* (1914), Hilda P. Hudson's *Ruler and Compasses* (1916), H. S. Carslaw's *Elements of Non-Euclidean Geometry* (1916), and H. Bateman's *Differential Equations* (1918).

Higher Mechanics. By HORACE LAMB. Cambridge, at the University Press, 1920. 8vo. 10 + 272 pages. Price 21 shillings.

Preface: "This book treats of three-dimensional Kinematics, Statics, and Dynamics in what I think a natural, as I have found it to be a convenient, order. It may be regarded as a sequel to two former treatises¹ to which occasional reference is made; but it is not dependent on these, and will I trust be readily followed by students who are conversant with ordinary two-dimensional Mechanics.

"The subject is of course a very wide one, and some principle of selection is necessary. I have tried to confine myself to matters of genuine kinematical or dynamical importance, avoiding developments whose interest, often considerable, is purely mathematical or now mainly historical. It is owing to such considerations that whilst some account is given of the Theory of Screws, of Null-Systems, and of Least Action, on the other hand brachistochrone problems, and the general theory of the Differential Equations of Dynamics, are left untouched.

"The book does not claim to be more than an elementary one, regard being had to the nature

¹ "Statics, Cambridge, 1912, and Dynamics, Cambridge, 1914."

of the subject. The reader who wishes to carry his studies further will find ample assistance in Thomson and Tait, in Rayleigh's *Theory of Sound*, and in Whittaker's *Analytical Dynamics*. And in common with other recent writers I must mention with a special sense of obligation the works of Routh, which in their later forms are an almost inexhaustible storehouse of theorems and results, and abound in interesting historical references."

Contents—Chapter I: Kinematics of a rigid body. Finite displacements, 1-13; II: Infinitesimal displacements, 14-33; III: Statics, 34-65; IV: Moments of inertia, 66-73; V: Instantaneous motion of a body (kinematics), 74-88; VI: Dynamical equations, 89-111; VII: Free rotation of a rigid body, 112-128; VIII: Gyrostatic problems, 129-150; IX: Moving axes, 151-176; X: Generalized equations of motion, 177-207; XI: Theory of vibrations, 208-248; XII: Variational methods, 249-270; Index, 271-272.

ARTICLES IN CURRENT PERIODICALS.

AMERICAN JOURNAL OF SCIENCE, fifth series, volume 2, September, 1921: "Some mechanical curiosities connected with the earth's field of force" by W. D. Lambert,¹ 129-158 [List of mechanical curiosities: (1) The limiting level surface with the sharp edge. (2) The smooth lake with different elevations for its two ends. (3) The tendency of large bodies to 'fall' towards the equator. (4) The tendency of a rod suspended horizontally like the Eötvös balance to 'fall' by twisting about the supporting fiber. (5) The existence of great local irregularities in the curvature of the level surfaces and the interesting possibilities that the study of these irregularities seems likely to offer. "]

ANNALES SCIENTIFIQUES DE L'ECOLE NORMALE SUPÉRIEURE, third series, volume 38, August to December, 1921: "Problèmes d'hydrodynamiques relatifs aux mouvements glissants" by R. Thiry, 229-339; "Sur les ensembles abstraits" by M. Fréchet, 341-388; "Recherches sur le théorème de M. Picard" by G. Valiron, 389-429; "Rectification et complément au mémoire de la goutte liquide tournante" by J. Boussinesq, 431-437 (see 1922, 20).

BULLETIN OF THE AMERICAN MATHEMATICAL SOCIETY, volume 27, June-July, 1921: "The April meeting of the American Mathematical Society" by R. G. D. Richardson, 389-400; "The Easter meeting of the Society at Chicago" by A. Dresden, 401-410; "The April meeting of the San Francisco Section" by B. A. Bernstein, 411-414; "The general theory of approximation by polynomials and trigonometric sums" by D. Jackson, 415-431; "The Einstein solar field" by L. P. Eisenhart, 432-434; "A covariant of three circles" by A. B. Coble, 434-437; "On skew parabolas" by Mary F. Curtis, 437-438; "The dispersion of observations" by J. L. Coolidge, 439-442; "The isomorphisms of complex algebra" by N. Wiener, 443-445; "On the generalization of certain fundamental formulas of the mathematical theory of finance" by C. H. Forsyth, 446-452; "The spread of Newtonian and Leibnizian notations of the calculus" by F. Cajori, 453-458; "Group theory reviews in the *Jahrbuch über die Fortschritte der Mathematik*" by G. A. Miller, 459-462; "Recent books on vector analysis" by J. B. Shaw, 463-465 [reviews of R. Gans's *Einführung in die Vektoranalysis, mit Anwendungen auf die mathematische Physik*, fourth edition (Leipzig and Berlin, 1921), of L. Silberstein's *Elements of Vector Algebra* (New York, 1919), of C. Runge's *Vektoranalysis*. Vol. I. *Die Vektoranalysis des dreidimensionalen Raumes* (Leipzig, 1919), of R. Leveugle's *Précis de Calcul géométrique* (Paris, 1920)]; Reviews by R. D. Carmichael of *Œuvres de G. H. Halphen* (2 vols., Paris, 1916-1918), 466-468, of G. H. Hardy's *Some famous problems of the theory of numbers and in particular Waring's problem* (Oxford, 1920), 471-475, and of O. Stolz and J. A. Gmeiner's *Theoretische Arithmetik* (2d ed., 2 vols., Leipzig, 1911-1915), 485; Reviews by D. E. Smith of F. Cajori's *A History of the Conceptions of Limits and Fluxions in Great Britain from Newton to Woodhouse* (Chicago, 1919), 468-470, of P. Kirchberger's *Mathematische Streifzüge durch die Geschichte der Astronomie* (Leipzig, 1921), 479-480, and of Emma Gifford's *Natural Tangents* (Manchester, England, 1920), 480; Review by J. B. Shaw of H. Lacaze's *Cours de Cinématique Théorique* (Paris, 1920), 470; Reviews by E. B. Wilson of H. Lamb's *Statics, including Hydrostatics and the Elements of the Theory of Elasticity* (Cambridge, 1916), 475-477, and of J. R. Eccles's *Advanced Lecture Notes on Light* (Cambridge, 1919), 485-486; Reviews by C. L. E. Moore of M. d'Ocagne's *Principes usuels de Nomographie* . . . (Paris, 1920),

¹ On page 141 he shows that a rod suspended horizontally (Eötvös torsion balance of the first kind) will tend to point east and west because the meridian sections of level surfaces in the earth's field of force are more curved than prime vertical surfaces. This tendency would seem to more than balance the tendency to point north and south that is due directly to the centrifugal force according to the statement in *Nature* of October 20, page 240 (see 1922, 22).